



FIG 1.

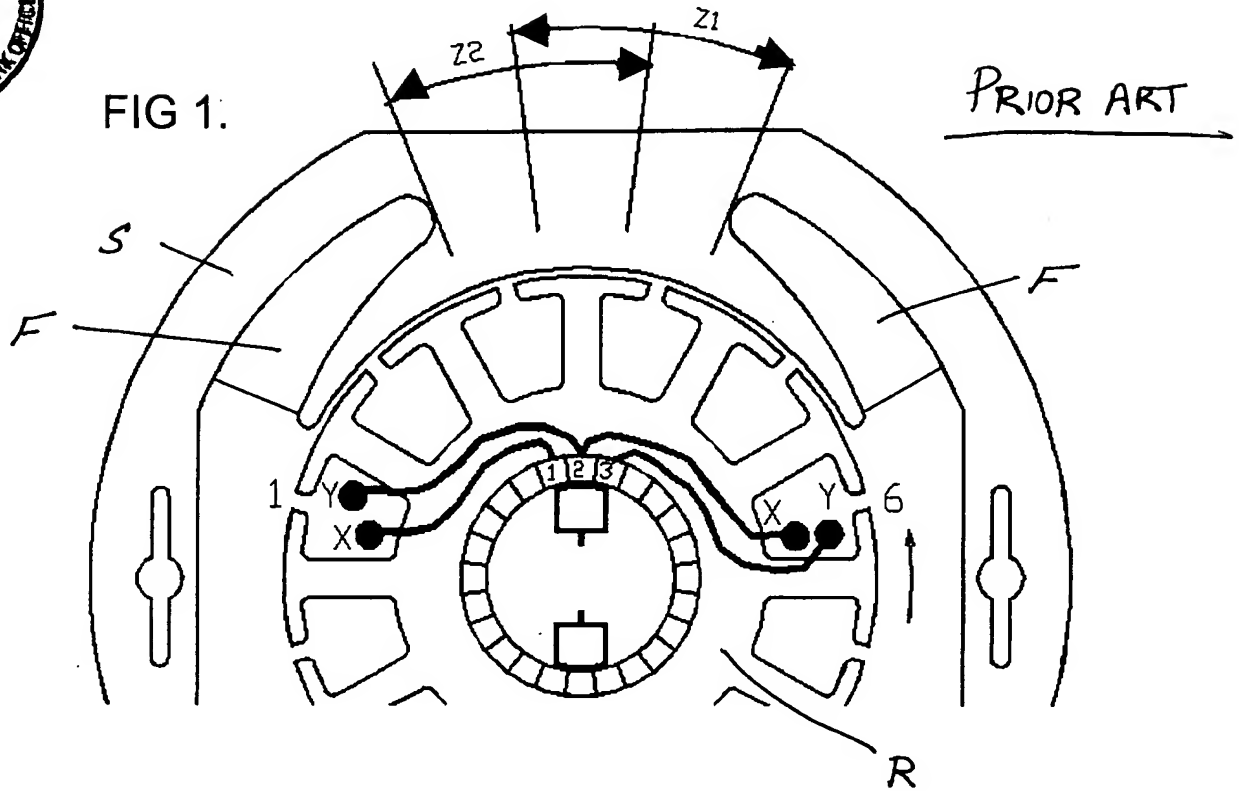
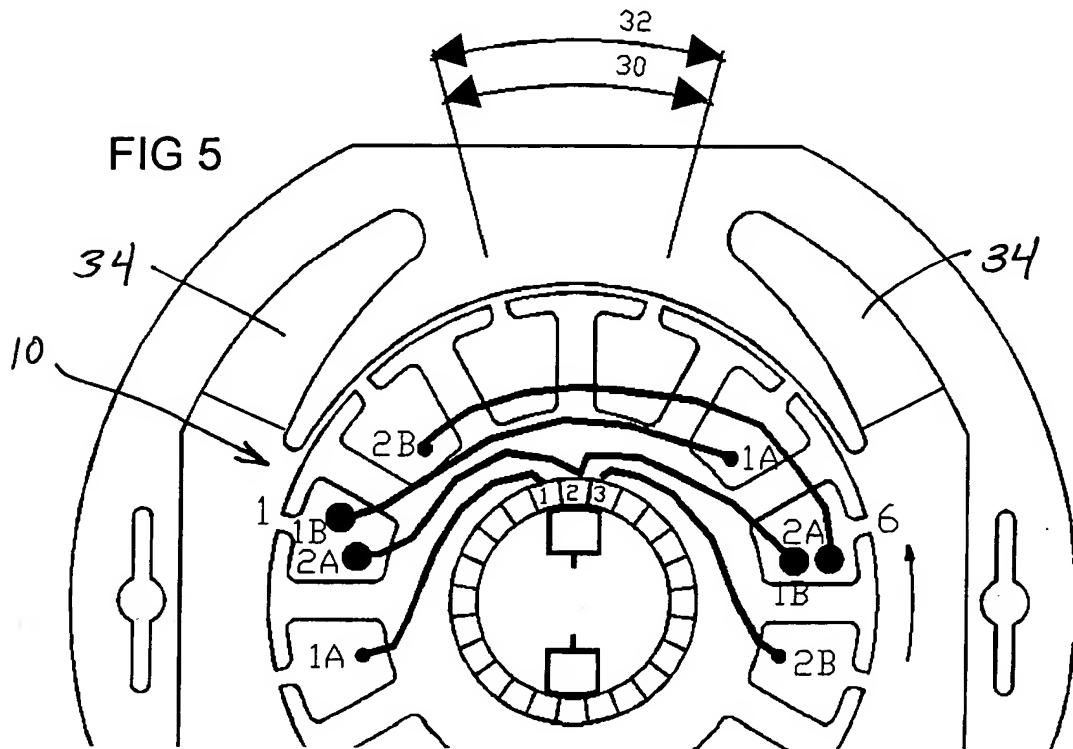
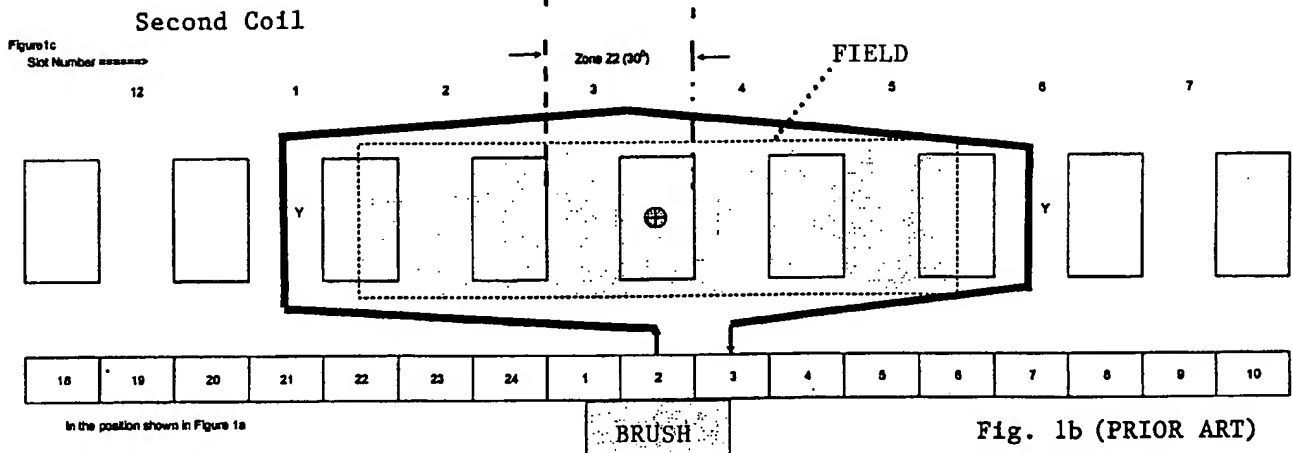
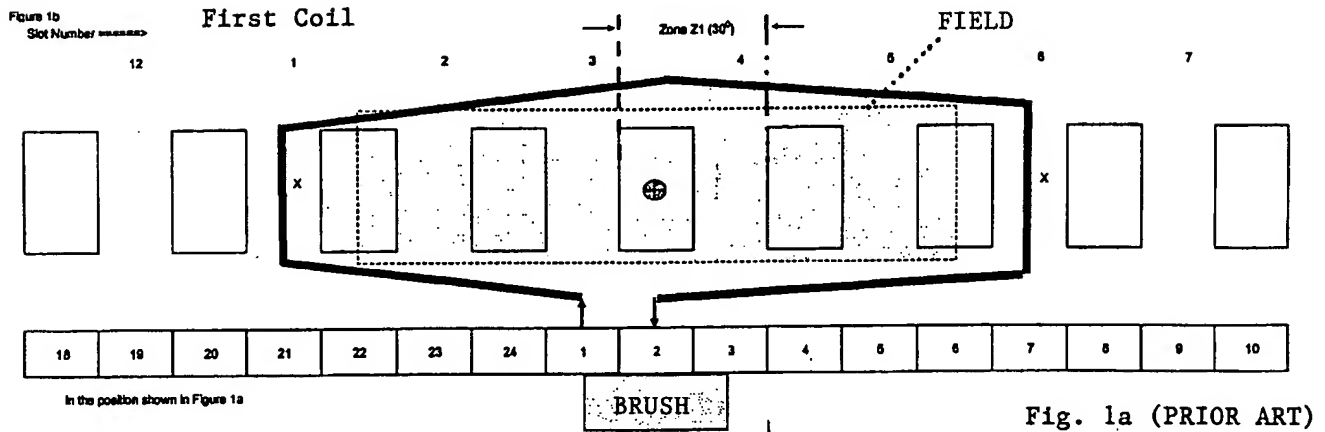


FIG 5



2/10



Key:

⊕ MAGNETIC AXIS of total coil

— Axis of field pole and brush

--- Position of MAGNETIC AXIS at start of commutation

--- Position of MAGNETIC AXIS at end of commutation

3/10

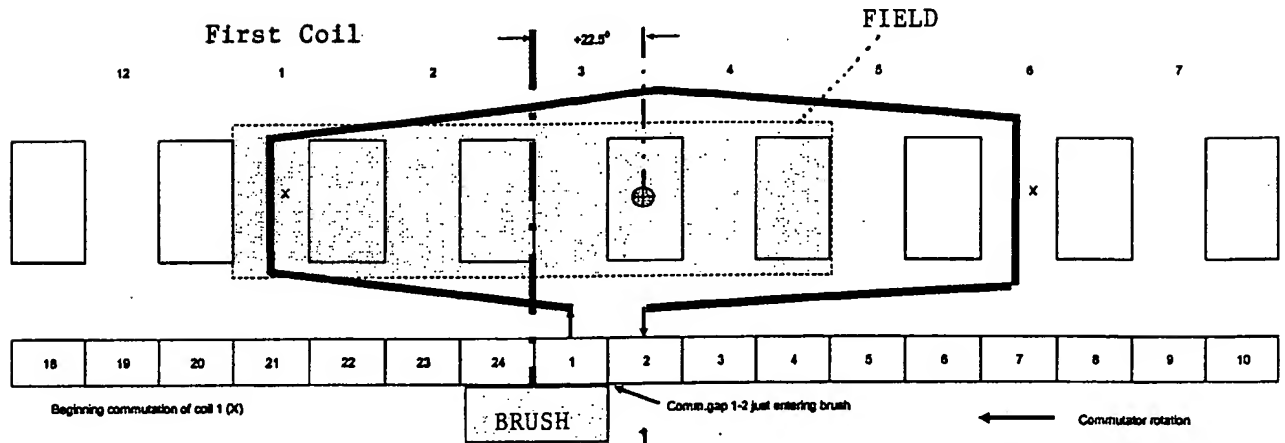


Fig. 1c (PRIOR ART)

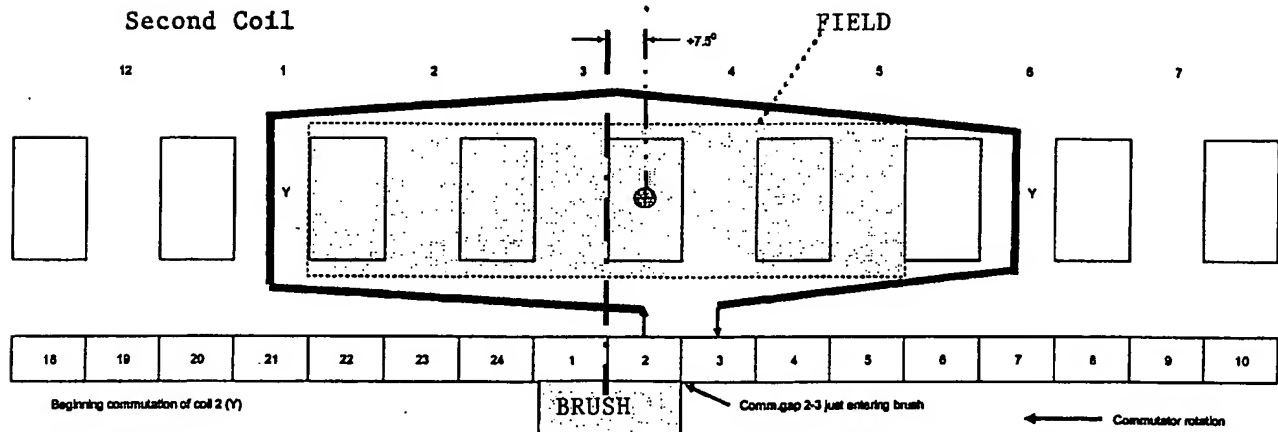


Fig. 1d (PRIOR ART)

Key:

- ⊕ MAGNETIC AXIS of total coil
- Axis of field pole and brush
- Position of MAGNETIC AXIS at start of commutation
- - - Position of MAGNETIC AXIS at end of commutation

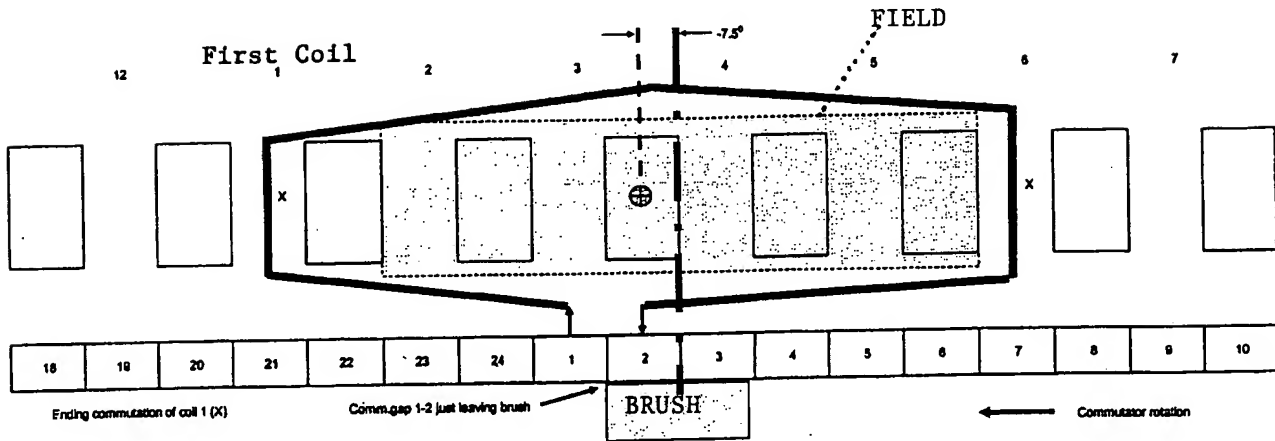


Fig. 1e (PRIOR ART)

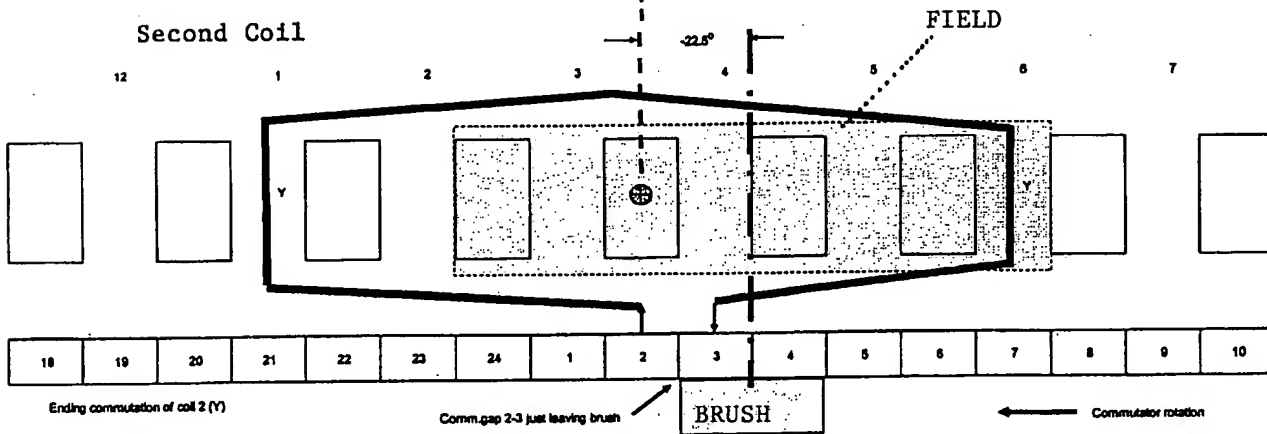


Fig. 1f (PRIOR ART)

⊕ MAGNETIC AXIS of total coil
 — Axis of field pole and brush
 - - - - - Position of MAGNETIC AXIS at start of commutation
 - - - - - Position of MAGNETIC AXIS at end of commutation

5/10

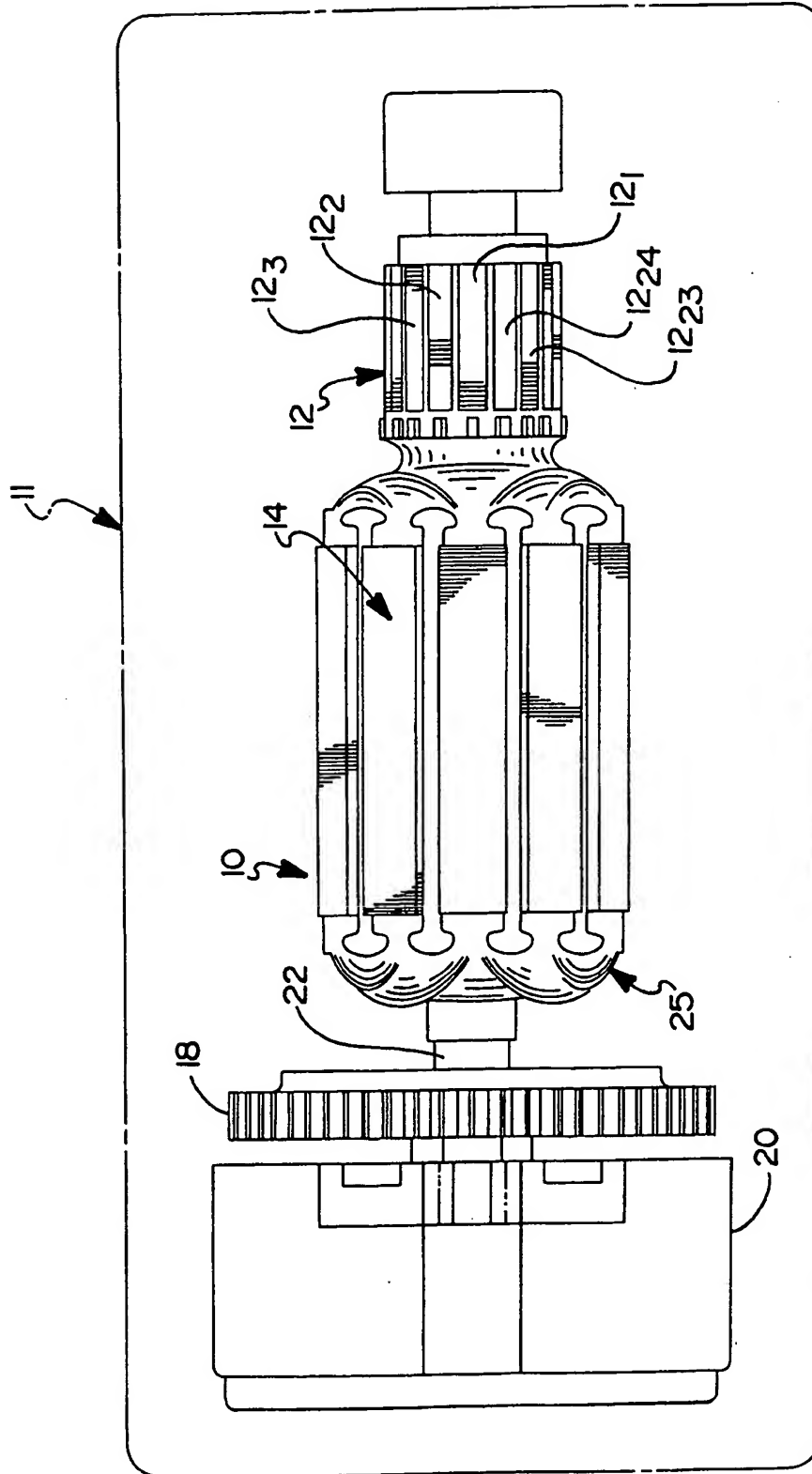
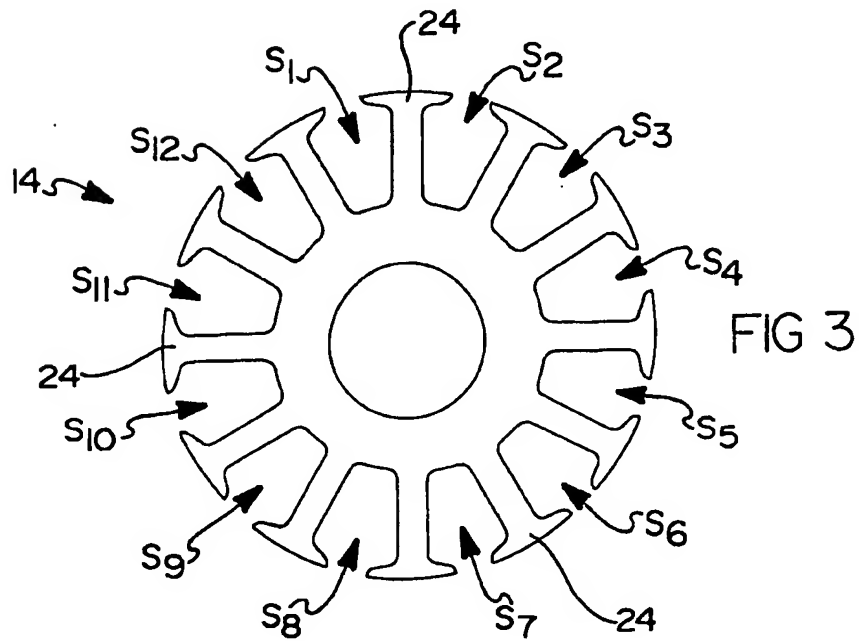
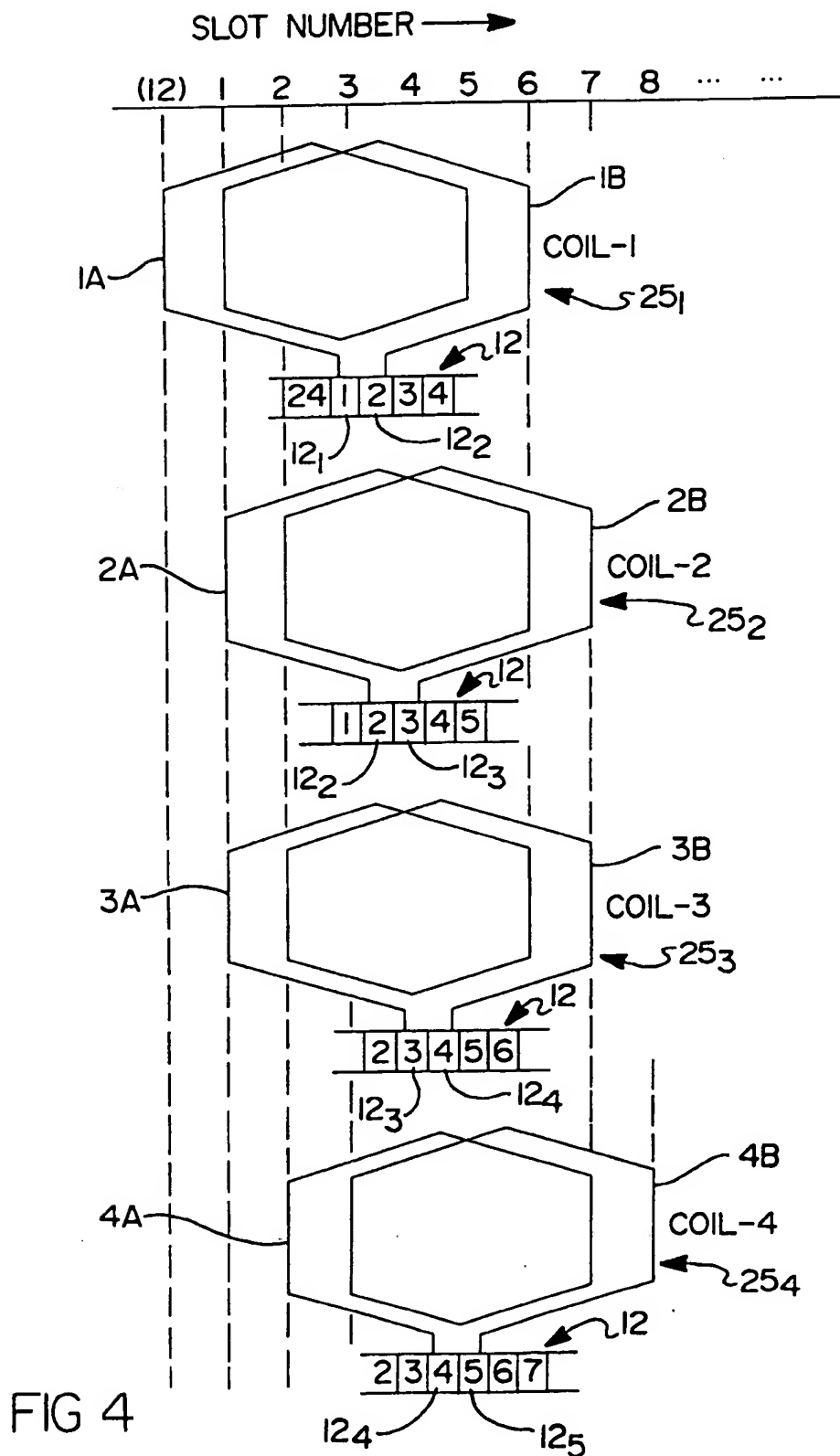


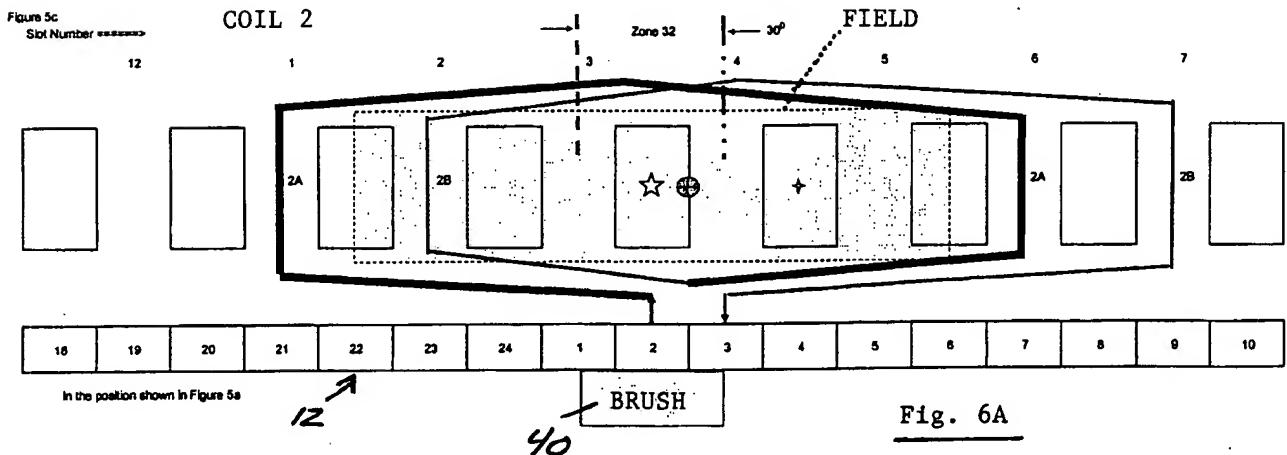
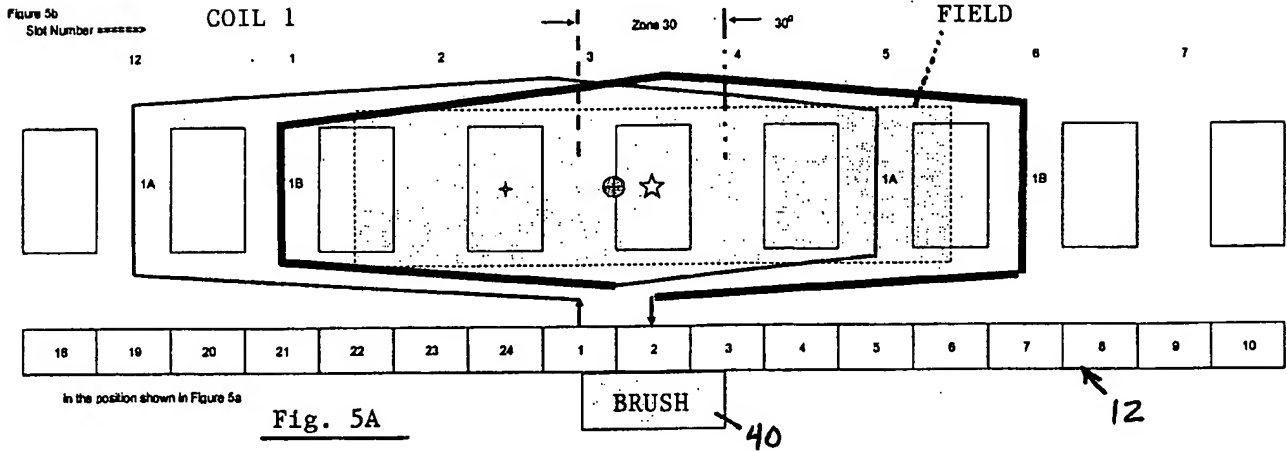
FIG 2



7/10

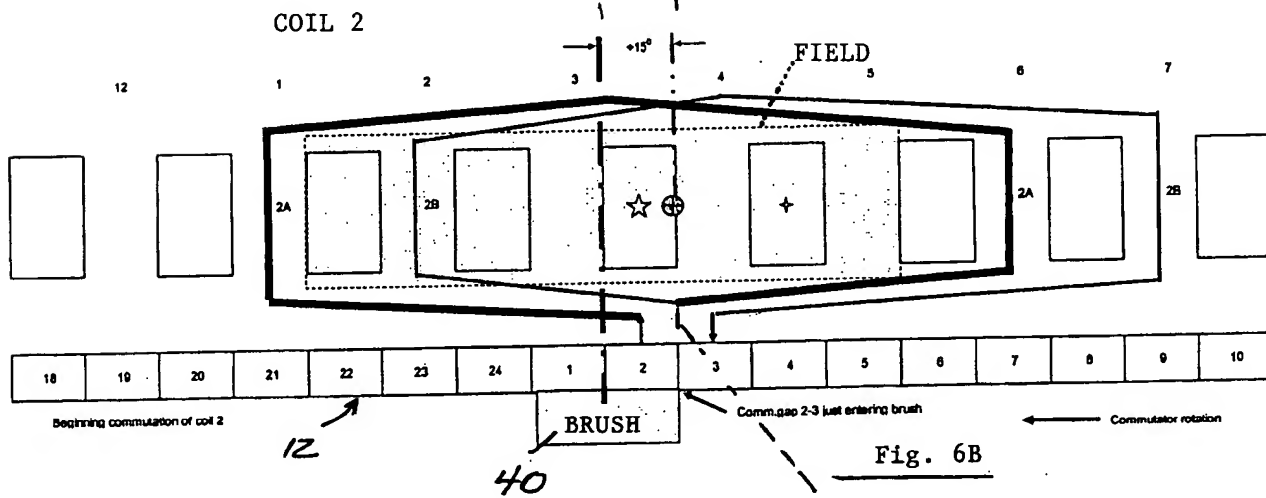
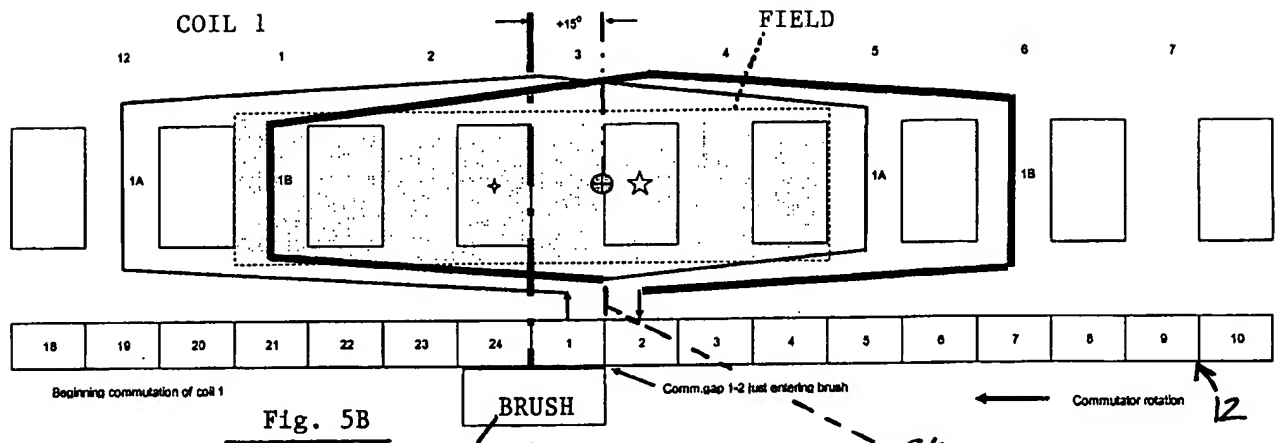


8/10



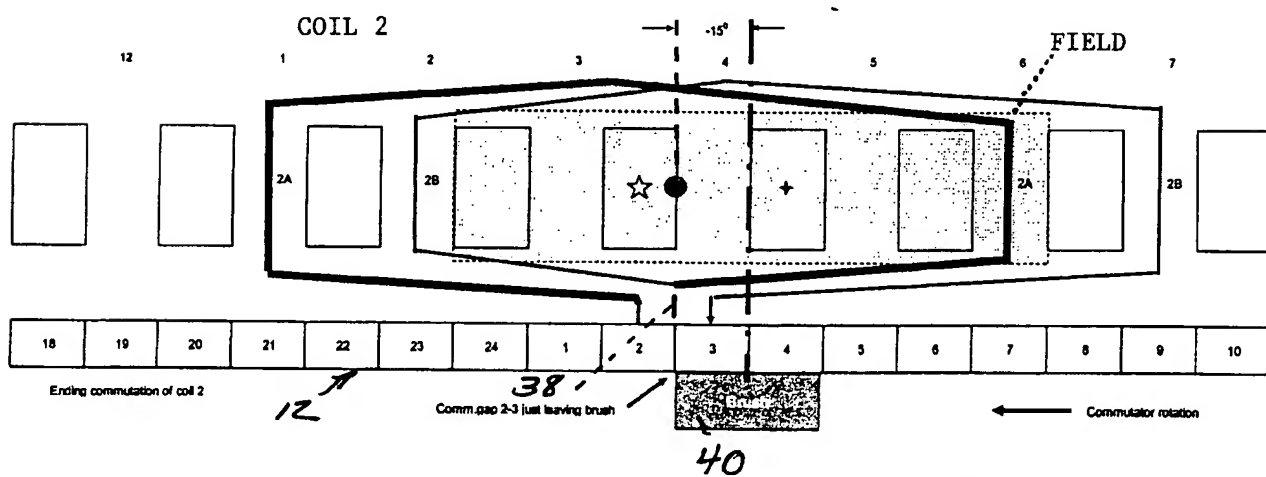
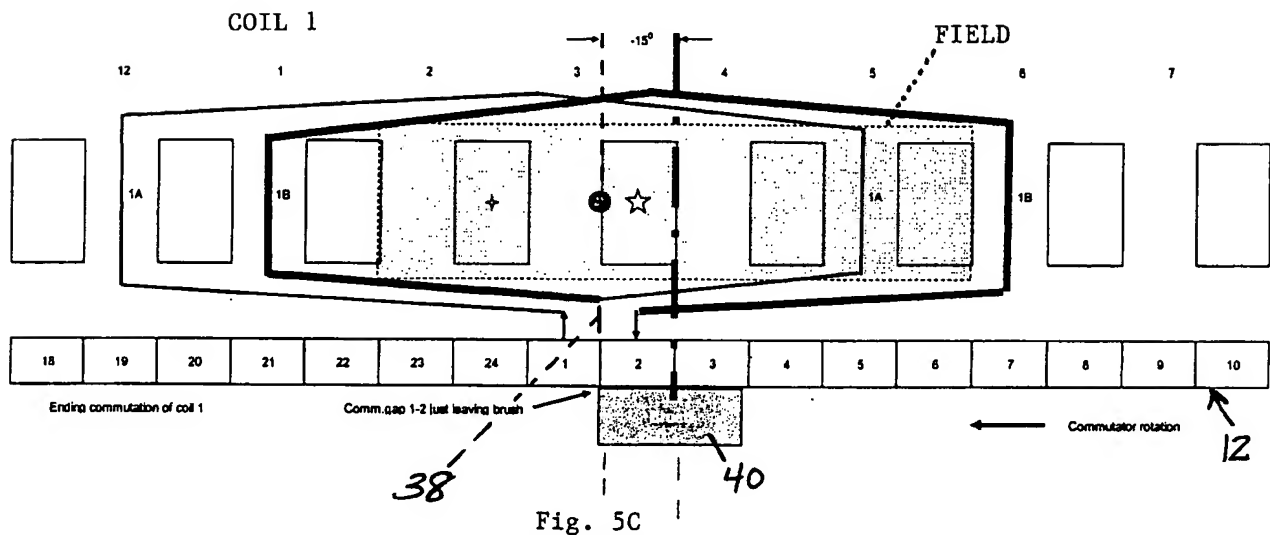
- KEY:
- ☆ Magnetic axis of larger subcoil
 - + Magnetic axis of smaller subcoil
 - ⊕ MAGNETIC AXIS of total coil (resultant)
 - — — — — Axis of field pole and brush
 - Position of MAGNETIC AXIS at start of commutation
 - - - - - Position of MAGNETIC AXIS at end of commutation

9/10



- Key:
- ☆ Magnetic axis of larger subcoil
 - ⊕ Magnetic axis of smaller subcoil
 - ⊕⊕ MAGNETIC AXIS of total coil (resultant)
 - Axis of field pole and brush
 - Position of MAGNETIC AXIS at start of commutation
 - Position of MAGNETIC AXIS at end of commutation

10/10



- Key:
- ☆ Magnetic axis of larger subcoil
 - + Magnetic axis of smaller subcoil
 - MAGNETIC AXIS of total coil (resultant)
 - Axis of field pole and brush
 - Position of MAGNETIC AXIS at start of commutation
 - Position of MAGNETIC AXIS at end of commutation